# Epidemiology in the Social Sciences

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• **The techniques and principles of epidemiology, so successfully utilized in the study and control of communicable diseases, should be applied to other mass phenomena in the community.**

**The local health officer should apply them in his "diagnosis" of the sicknesses of his organized community.**

**Epidemiological methods have been used to study mental diseases as well as chronic diseases, and an experiment in using epidemiological methods on the county level to study psychosocial disorders has been carried out.**

**The impact of psychosocial episodes on somatic diseases is now generally accepted and well documented. Individual practitioners of medicine are becoming more interested in the significance of social tensions on the health of their patients.**

**Public health physicians, specialists in preventive medicine, are the best equipped by training and experience to take the leadership in the application of epidemiological methods to sociomedical problems and are in a unique position to assist their colleagues in the private practice of medicine in providing modern helpful and meaningful health protection to their patients.**

**Organized medicine might well become more cognizant of the sociological changes taking place in the nation as they relate to health and assume the responsibility for aggressive leadership in the anticipation of and the solution of these problems.**

THE OBJECTIVES of this paper are: first, to explore the application of epidemiological principles to the broad and often poorly defined field of social science; second, to report an experiment carried on in San Mateo County during the past four years in this field; and, third, to cite several examples from administrative experience illustrating the importance of a broader knowledge on the part of physicians, and particularly health officers, of the social sciences and the possible consequences of our failure as physicians to be cognizant of sociological phenomena in our communities.

Most physicians are familiar with the concepts of epidemiology and are comfortable in the use of the word, although few could perhaps claim the title *epidemiologist* in the same class with those who have made great contributions to our medical knowledge, such as William Budd, Pannum, John Snow, Chapin, Lumsden, Frost, Rosenau, Ricketts, Godfrey and John Gordon. Many persons think of epidemiology as having to do almost exclusively with infectious disease. Godfrey pointed out in the early twenties that epidemiology and the epidemiological method had application to many other morbid conditions, such as goiter, heart disease, lead poisoning, diabetes and deficiency diseases. When epidemiologists emancipated this specialty from its restriction to communicable diseases and began to explore other mass diseases, as reflected in degenerative and neoplastic processes and in physical injury, the application of epidemiological procedures to other fields was well established. In 1939, Elkind[3] proposed that epidemiology could be applied to mental disease. In 1949, John Gordon[6] published an epidemiological paper on accidents in which he said that "the part exerted by the socio-economic environment is probably the most neglected of any epidemiological influence." Gordon and Lindemann[7] published an extensive analysis of "The Biological and Social Sciences in an Epidemiology of Mental Disorders" in which they stated, "Epidemiologists through association with social scientists, psychologists, anthropologists and psychiatrists are gaining a better understanding of group characteristics of mental diseases and also an insight into potential application of the social sciences to other kinds of mass disease."

On the other hand, the term *social sciences* does not conjure a clear concept in the minds of most of us. It means something rather vague and nebulous, not particularly related to medicine and, perhaps, even a little dangerous and undesirable. In fact, there is reasonable doubt in the minds of many physicians as to what is scientific about the social sciences. However, social science is not new, as some of the basic concepts are found in Plato's *Republic and Laws* and in Aristotle's *Politics*. Social science is defined as "(1) that science that deals with human society or its characteristic elements, as family, state or race and with the relations and institutions involved in man's existence and well-being as a member of an organized community; sometimes synonymous with politics or more often with sociology; (2) one of the group of sciences dealing with special phases of human behavior, as economics, sociology, politics, ethics, etc."

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The social sciences should be of particular interest to specialists in preventive medicine, as health officers are considered the physician to the "organized community" in contrast to the private practitioner who serves as the physician to the individual. And yet, it sometimes seems that we health officers are so preoccupied with the problems of budget, administration, personnel, public relations, professional relations, annual reports, new programs, committee meetings and so on, that we fail to really take a good community history, do a competent examination or even attempt to diagnose, much less treat, the ills that beset the particular "organized communities" for which we are responsible. Most of us over the last decade have finally, and often grudgingly, admitted that as health officers we do have a responsibility in the field of chronic diseases; that modern public health is more than environmental sanitation, communicable disease control, vital statistics, health education and maternal and child health services; and that some of our communities are pretty "sick" as communities, in spite of a creditable job done in the traditional public health fields with the collaboration of our fellow private practitioners.

Gordon and Lindemann analyzed the difficulties of an epidemiological study of mental disease, but competent studies have shown that emotional and mental disorders are as common as somatic disease, if not more common. Studies in Baltimore[11] showed that "approximately 10 per cent of an urban population have one or more of the relatively well defined mental disorders." In a 1957 survey in Yorkville, New York,[12] 30 per cent of the population included were found to have handicapping and serious mental illness; and a study by Leighton[10] revealed a similar figure in Nova Scotia, 32 per cent of the population having severe mental illness of a handicapping degree. If these proportions pertain to our California communities and if we are truly concerned with the prevention and control of all disease, then obviously health officers must turn their attention to this field.

The experiment I would like to report, as an example of the application of epidemiological principles to a social problem, was reported in detail last April in *Mental Hygiene*.[1] This experiment was not designed by a health officer or an epidemiologist, although its authors had been exposed to some very sound epidemiology by one of their associates, the late Dr. Carl Buck. The designers of the experiment were trained in the field of social work and had had many years of experience in the field of community organization and administration. From 1948 to 1952, these investigators carried on an intensive study of the social and health agencies in Greater St. Paul,[2] both official and voluntary, and came to the conclusion that by far the largest portion of the service and money provided by the major administrative units was expended on 6 per cent of the families in the community. The services relating to the problems isolated were concentrated on this relatively small proportion of the population that was made up of seriously disorganized multiproblem families. The investigators isolated three general areas of concern: (1) chronic dependency; (2) chronic disability; and (3) disordered behavior.

Their next step was to select three areas (Winona, Minnesota,[5] Hagerstown, Maryland,[4] and San Mateo County[2]) in which to study each of these factors more intensively. The study in San Mateo County was subsidized by the Rosenberg Foundation of San Francisco, and the overall study was assisted by the Grant Foundation of New York. The investigation of disordered behavior was started in San Mateo County in January of 1954. The first step was to attempt to define what was included in "disordered behavior." The definition selected was "behavior which is either legally prohibited or generally disvalued by society." The next epidemiological step was to define the sources of reporting already existing which would reflect symptoms of disordered behavior. Three general categories were established:

1. *Adult disorders,* as indicated by major crimes, minor crimes and misdemeanors, voluntary admissions and commitments to mental institutions;

2. *Marital disorders or dysfunctioning,* as indicated by divorce, official separation or desertion, separation of children from their own home to agency care; and

3. *Child disorders,* as indicated by officially reported delinquency and truancy, noneconomic school dropouts, commitments to mental institutions.

The third step was to attempt to count these incidents which seemed to be the signs and symptoms of disordered behavior in the community, and which came to official attention. Hence, in January of 1954, all agencies involved in this field were asked to report to a central bureau all cases in these categories that became known to them during this month. These reports, when summarized, represented the "prevalence" of disordered behavior as defined for the study in San Mateo County. During the January 1954 "prevalence" study, 72 local and state agencies cooperated in reporting. Detailed analysis indicated that data from ten agencies were sufficient to identify and isolate the problems of disordered behavior in the county and to secure the epidemiological data necessary for study, and these ten were asked to continue reporting for the three years of the study.

Using the definition cited above, we found that in January of 1954 27 families of every 1,000 families in the county were known to agencies for one or more episodes of disordered behavior. We also found that 5.8 per cent of the families were multiproblem families which were absorbing nearly 70 per cent of the total community resources for welfare, delinquency and voluntary social services. In January of 1954 there were 13,074 Family Unit Report Schedules filed with the study staff by the 72 agencies (local and state) cooperating in the study. When these were edited and consolidated to eliminate duplicate reporting, it was found that there were 10,078 schedules. Two hundred twenty-seven of the total were for hospital care only, leaving 9,851 families made up of 24,159 individuals to be included in the study.

Of these 9,851 families, 5,359 (54.4 per cent) were multiproblem families—that is, showing some combination of dependency, ill health or disordered behavior—and 4,492 (45.6 per cent) were single problem families. By far the greatest number (5,456) were reported as disordered behavior cases, 3,073 of them (56.3 per cent) in single problem families, *i.e.*, only disordered behavior, and 2,383 (43.7 per cent) in multiproblem families.

This summary of some of the gross findings gives a general idea of the type of data gathered by use of epidemiological methods. Continuation of the reporting to the central roster soon revealed that, while 56.3 per cent of the reported disordered behavior families were neither dependent nor disabled, there developed a pattern of recidivism in those families known to the roster. That is, not only did the single individual tend to repeat asocial acts, but the various members of the family tended to get into many kinds of difficulty with official agencies. The developments of this concept of the study are too detailed to be reported here and are all discussed in the publication already referred to.[2]

At this point, one might well be tempted to use the flippant teen-age comment "So what?" for it might be contended that this study designed and carried out by social workers on a social problem has little relation to public health. However, if our interest as physicians and health officers really extends beyond the prevention and control of the zymotic diseases, then this study has significance as shown by a paper presented to the American College of Physicians last spring by Hinkle and Wolff.[9] These investigators followed the records of 3,535 patients over long periods. They found first that "during two decades of young adult life, one fourth of the individuals experienced over one half of all of the episodes of illness that had occurred among all of the people in the study." And they said: "The distributions were such that they can be explained only by assuming that some factor in addition to chance operates to determine them. In other words, the members of each group behaved as if there were differences in their susceptibility to illness. . . . The members displayed a difference in their susceptibility to illness in general, not simply the result of differences in susceptibility to one or another specific syndrome."

The second important observation was that the illness histories seemed to show "clusters" of illnesses in certain periods of the patient's life. Meticulous study revealed that the great "majority of clusters of illness episodes that occurred in the lives of these patients occurred at times when they perceived their life situations to be unsatisfying, threatening, overdemanding, and productive of conflict, and they could make no satisfactory adaptation to these situations." The following is the closing paragraph of their paper:

"The evidence indicates that the reaction of a man to his life situation has an influence upon all forms of illness and that it plays a role of significance in at least one third of all episodes of disease, regardless of their nature or location, the cause or their severity. Ultimately medicine will have to take account of this in the treatment of illness. It is very probable that an increasing proportion of the therapeutic effort will have to be directed at the patient's relation to his environment if we wish to make any significant improvement in his health. In view of the complexities involved in dealing with human relationships, human attitudes and human behavior and the ineffectiveness of our present methods of dealing with these, it is also very probable that these efforts will be difficult, time consuming and not, at first, highly rewarding. The problem stands before us as a stern challenge to medicine and not as an easy opportunity."

If we consider these findings in the light of the data of the California Health Survey,[8] which showed that for every 1,000 California citizens in the sample year there were 2,550 episodes of acute illness causing one or more days of disability, and 1,280 episodes of chronic disease causing one or more days of disability, the importance of the psychosocial factors in disease causations places a heavy responsibility on the health officer and the private physician to take into serious consideration the impact of socio-environmental factors on health.

Two or three experiences might serve to illustrate the point. Within the last year two pediatricians of real stature have conferred with us in this general field. One of the pediatricians was involved in a survey of the health needs of children on the San Mateo Peninsula. After about an hour's discussion

of the social problems of children, involving dependent and neglected children, the functions of the receiving home, foster home placements, adoptions, services for the mentally retarded, the cerebral palsied child, crippled children's services and the like, he said, "I have been in the practice of pediatrics for 15 years in this area and never realized that all of this activity with impact on the lives of children was going on in this county."

The second pediatrician, a former member of the Council of the California Medical Association, came to us and asked if we could discuss some of the services of the county which affected children because he had been appointed to a Governor's Committee on Children and found that he was ignorant of the facilities in his own county which were being discussed at the meetings of the committee.

The one agency in our area which seems to have real appreciation of the psychosocial factors in children's development is the Children's Health Council of the Mid-Peninsula, organized by Dr. Esther Clark. Here the child is not only treated by the individual specialists—orthopedist, psychiatrist, physical therapist, speech therapist and others—but the whole family situation is studied, diagnosed and treated as well.

Another example, from the other end of the life cycle: Last spring I had the privilege of speaking to the Western Hospital Association on the Forand Bill then under consideration by the 85th Congress. In preparation for the discussion, I wrote to both the California Medical Association and the American Medical Association for data and received very prompt, gracious replies and assistance from both. By analysis of the bill, supplemented by the material from the American Medical Association, the California Medical Association, the American Hospital Association, and our local Congressman, I tried to impress on the audience the undesirable features of the bill and the impact its possible passage would have on both hospitals and the practice of medicine. However, I could not overcome the personal feeling that, had we in preventive medicine, had individual practitioners and had organized medicine taken a more active interest in the socio-economic and psychosocial problems of the aging, there would have been perhaps little need to introduce into Congress a bill as drastic as H.R. 9467. While sociological changes are not usually cataclysmic but rather slow and gradual, and have been perhaps of more interest to historians than to practicing physicians, I think it behooves us all to constantly analyze changes that are taking place in our "organized communities" and the implications these changes hold for medicine.

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**REFERENCES**

1. Buell, B., Beisser, P. T., and Wedemeyer, J. M.: Reorganizing to prevent and control disordered behavior, Mental Hygiene, 42:155-194, April 1958.

2. Buell, B., and Associates: Community planning for human services, Columbia University Press, 1952.

3. Elkind, H. B.: Is there an epidemiology of mental disease? Am. J. Pub. Health, 28:245, 1938.

4. Eller, C. H., Hatcher, G. H., and Buell, B.: Health and Welfare Issues in Community Planning for the Problem of Indigent Disability, Supplement to American Journal of Public Health, Vol. 48, No. 11, Part II.

5. Glabe, D. B., Feider, L. J., and Page, H. O.: Reorientation for Treatment and Control, "An Experiment in Public Welfare Administration," 1958.

6. Gordon, J. E.: Epidemiology of accidents, Am. J. Pub. Health, 39:504-515, April 1949.

7. Gordon, J. E., and Lindemann, E.: The biological and social sciences in an epidemiology of mental disorders, Am. J. Med. Sci., 223:316-343, July 1954.

8. Health in California, Report of California Health Survey, California State Printing Office, 1957.

9. Hinkle, L. E., and Wolff, H. G.: Ecological Investigations of the Relationships Between Illness, Life Experiences and the Social Environment.

10. Leighton, D. C.: Distribution of psychiatric symptoms in a small town, Am. J. Psychiatry, 112:716-723, March 1956.

11. Pasamanick, B., Roberts, D. W., Lemkau, P. V., and Kruger, D. E.: A Survey of Mental Disease in an Urban Population in Chronic Illness in a Large City, Vol. 4, Chronic Illness in the United States, Harvard Press, 1957.

12. Rennie, T., Srole, L., Opler, M., and Langner, T.: Urban life and mental health, Am. J. Psychiatry, 113:831-836, 1957.